rejection that Charter teaches a preform comprising a liquid binder material coated on a fibrous carrier strand and a molded composite article thereof. The Examiner then notes that the fibrous carrier strand could be a chopped roving within the range contemplated by Applicants in claims 28 and 31. The Examiner also notes that the matrix material can be a resin of the sort set forth by the Applicants in claims 24 and 25. Finally, the Examiner states that claims 17, 18, 22, 26 and 29 are product-by-process claims, with patentability resting solely in the product, and are rejected in the absence of clear factual evidence to the contrary of unexpected or superior properties related to the process. Applicants respectfully traverse the Examiner's rejection.

Charter et al. discloses a method for making glass fiber resin composites that include the formation of a fiber preform. In this process, the preform is made by first adding a predetermined amount of the resin binder forming material to the mold and a predetermined amount of chopped glass fibers on top of the binder forming liquid, therein causing the binder liquid to wet out the glass fibers. The resin binder, as shown in column 8, lines 50-54, is thinned with solvent to between 1000 and 2000 centipoise for application. The preforms are then sent to a maturation room to thicken, wherein the solvent is removed. The maturation process, as shown in Column 7, lines 62-65, also involves the thickening reaction between the metal oxide and the carboxyl groups of the binder resin. The preforms may then be added to a mold and combined with a matrix polymer to form a composite part.

The present invention, as claimed in claims 17, 18, and 22-31, all require the formation of a string binder prior to the formation of the preform and subsequent formation of a molded composite article. A string binder, as defined on page 4, lines 20-25 of the specification, comprises a pre-impregnated strand with a binder resin that is chopped into segments. The string binder is then heated to partially melt the binder resin, therein fusing the individual fibers together to form a preform. The resin components in the string binder does not crosslink during the formation of the preform. The string binder is made by applying a catalyst composition and a solvent free binder resin composition having an acid value of less than 30 mg/KOH to the surfaces of the

fibrous substrate and solidifying the coating to form the string binder. The string binder is then chopped into segments, introduced to a porous form, heated to partially melt the binder and fuse the segments to form a preform structure. The preform is then easily transportable and storable prior to forming a composite part. The melting temperature used to fuse the segments of the fibrous substrate is necessarily less than the temperature necessary to cure the liquid resin in the subsequent molding process to form a composite part.

Charter et al. does not describe a string binder as defined in the present invention. Instead, it describes a method for making a preform specifically without the use of a string binder precursor. The Charter et al. disclosure further requires the use of solvent during the application process to thin the resin binder to an application viscosity, while the resin system in the present invention is solvent free. The preform in the Charter et al. disclosure also requires a thickening reaction to take place to form the preform, which the present invention does not require.

Thus, claims 17, 18, and 22-31 are distinguished from the Charter et al. reference because each claim recites the use of a string binder, which the Charter et al. reference does not disclose. Further, the preform formed in the Charter et al. reference is different chemically than the claimed preform in the present invention. Claims 17, 18, and 22-31 are therefore novel over the Charter et al. reference. Reconsideration of claims 17, 18, and 22-31 is respectfully requested.

Regarding the Examiner's rejection of claims 17, 18, 22, 26 and 29 as being product-by-process claims, the Office Action proposes that the claims would be allowable if Applicants can show by clear factual evidence of the contrary and unexpected or superior properties related to the process, presumably to Charter et al. Applicants respectfully submit that the process for forming a string binder meets these requirements. Further, Applicants respectfully submit that the claims drawn to forming a preform from a string binder and forming a composite part from a string binder each meets these requirements.

MPEP 2113 states that "product-by-process claims are not limited to the manipulations of the recited steps, only the structure that implies these steps". The patentability of product-by-process claims, as the Examiner notes, is not dependent upon the method of production, but the product itself.

The string binder is formed in the absence of solvent and utilizes a binder resin composition that is b-stageable (meltable without crosslinking). The string binder also introduces a catalyst composition that is activated at high temperatures (i.e. above the melt temperature of the binder composition). The string binder may subsequently be chopped onto a screen and melted to form a preform. As stated above, the Charter et al. reference does not teach a string binder, but instead teaches a preform structure. Thus, the claims related to the formation of a string binder, here claims 17 and 18, are unique over Charter et al. and are thus allowable. Reconsideration of claims 17 and 18 is respectfully requested.

Similarly, the multi-end roving of claims 26 and 29 also contain the string binder that the Charter et al. reference does not disclose. As such, the claims 26 and 29 related to the formation of the multi-end roving having the string binder are unique over Charter et al. and are thus allowable. Reconsideration of claims 26 and 29 is respectfully requested.

Also, the preform of Charter et al. is formed utilizing a solvent-based binder system followed by a maturation process. The maturation process, as shown in Column 7, lines 62-65, allows the thickening reaction between the metal oxide and the carboxyl groups of the binder resin. The maturation process also removes a substantial portion of the solvent. The preform formed according to claim 22 does not contain any solvent and does not involve the reaction product between a metal oxide and a carboxyl group. Instead, the preform is formed by simply melting the string binder at a temperature that is less than what is required for crosslinking to fuse the fibrous segments to form a

preform. Thus, the preform formed in claim 26 is different than the preform in Charter et al. As such, claim 26 is novel. Reconsideration of claim 26 is respectfully requested.

In view of the foregoing amendments and remarks, Applicants submit that claims 17, 18, 22-31 are allowable. The Examiner is invited to telephone the Applicants' undersigned attorney at (740) 321-7167 if any unresolved matters remain.

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